AN INTRODUCTION TO SUM-PRODUCT NETWORKS

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Abstract. Sum-Product Networks (SPNs) are deep probabilistic graphical models (PGMs) that compactly represent tractable probability distributions. Exact inference in SPNs is computed in time linear in the number of edges, an attractive feature that distinguishes SPNs from other PGMs. However, learning SPNs is a tough task. There have been many advances in learning both the structure and parameters of SPNs in the past few years. One interesting feature is the fact that we can make use of SPN's deep architecture and perform deep learning on these models. Since the number of hidden layers not only does not negatively impact the tractability of inference of SPNs but also augments the representability of this model, it is very much desirable to continue research on deep learning of SPNs. In this article we seek to produce a tutorial on Sum-Product Networks in a simpler, clearer way then how it is currently written in literature. We will introduce SPNs and explain how knowledge is represented in this model, how to perform exact inference and describe in detail a simple structural learning algorithm.

1. Introduction

Hello. I am introducing a very important subject in a clear way.